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## **Determinants of enrollment in the NHIS for women in Ghana**

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Keywords:	health insurance, social health protection, Ghana, household survey

**Abstract**

**Background**

The National Health Insurance Scheme (NHIS) was introduced in 2005 to provide equitable access to healthcare. Furthermore, concessions were made for pregnant women, yet inequities in access continue to exist. This study explores whether dimensions of social exclusion explain why some groups of women are not benefitting from the scheme.

**Methods**

Data was collected from 4050 representative households in five districts. Logistic regression is used to examine the factors that determine enrolment of women under the NHIS.

**Results**

The study sample consists of a sub-sample of 3,173 women out of whom 58% were insured. The majority (64.9%) of the women were in the reproductive age (15-45 years). The results show that wealth status, age, health status, locality, perception about the quality of care at health facilities and perception of the NHIS, are the key factors that determine enrolment into the scheme.

**Conclusion**

With women dominating the informal sector of Ghana’s economy which is often characterised by relatively low incomes, these inequities in access need to be addressed.

**Key words:** health insurance, enrolment, women, household survey, social health protection

## Background

Healthcare financing in Ghana has gone through many dynamics, from free healthcare at the eve of independence to the introduction of the nominal fee in the 1970s and the 1980s full cost recovery, popularly known as the 'Cash and Carry' system. Recognising that direct out-of-pocket payment limited access to healthcare, the Government of Ghana declared its intention to abolish the system, and began exploring the feasibility making health care more affordable by the introduction of a National Health Insurance Scheme (NHIS). Since its implementation in 2005, the NHIS has become one of Ghana's flagship social protection interventions with the aim of increasing access to healthcare and improving the quality of basic healthcare services for all citizens, especially the poor and vulnerable.

It is expected that with the NHIS in place, equitable access to healthcare will be assured for all groups of people. However, ten years on, access remains a challenge especially for women who are faced not only with different health needs and risks but also bear a greater burden of disease [1]. Women are faced with unequal rights and resources coupled with minimal participation in household decision making which further restricts their access to quality care [2,3,4]. Although gender equality incorporates discussions on issues affecting men and women this paper focuses on women in Ghana due to disadvantaged position in which many of them find themselves in terms of access to resources. Indeed, some of the factors underlying differential health outcomes among women and men have been noted to be socioeconomic with factors such education, income, occupation and cultural cited as some of the strongest [5-7].

A number of authors have attributed the low coverage of the scheme to unaffordable premium, perceived poor quality of health services, lack of trust, and confusion over basic details of the scheme, among others [8-10]. It has been found that certain groups of persons, especially the poor are systematically excluded from the NHIS [11-14]. Women have been noted to face greater difficulties in accessing adequate care. Widows and elderly women have been known to delay or forego treatment without external support [15-16]. However, fewer papers on the NHIS have taken account of the specific health needs and constraints of women. We aim to fill this gap by using a social exclusion lens to explore what factors determine the participation of Ghanaian women (i.e. 15 years and above) in the scheme.

**Literature review**

The justification for the introduction of health insurance in developing countries has been seen as a means of sharing risks as well as mobilising resources [17-19]. Health insurance replaces out-of-pocket expenditures at the point of need with smaller regular contribution (premiums), which allows individuals to gain access to care, especially some of those who previously could not afford it [20-21]. While health insurance improves access to health care for members, there will still be individuals who cannot afford the premiums [13, 22]. Access to health care can also be restricted by other indirect financial and non-financial barriers, such as travel costs, loss of income, and other social and cultural values [23-25]. There are also some systemic barriers which also deter individuals from accessing insurance in the first place. These include the bureaucratic nature of accessing insurance benefits, the limited portability of the insurance scheme and the perceived negative attitude of health staff towards patients insured [26].

Identifying which determinants influence individuals in their decision to seek health insurance is a daunting task. This is due to the extensive range of potential factors spanning across many dimensions such as economics, social, political and culture. A number of empirical studies have also shown that there are several factors that determine women's enrolment in insurance schemes [ 27 -30]. Kirigia et al., [27] identified some demographic and socio-economic attributes of South African women that influenced health insurance ownership. Studies in Ghana, have found income, religion, age and access to relevant information on health as significant predictors of demand for insurance [28 -30]. Spatial location and wealth status were found to be significant in determining participation in health insurance among women in Ghana [31]. In Indonesia, Christiani et al. [32], examined determinants of access to health insurance by women in some major cities using multilevel logistic regression analysis. The results showed that, women's age, education, wealth status and being in paid work were consistently associated with the probability of having health insurance.

The literature, both theoretical and empirical reveal the multidimensional nature of the factors that determine women's enrolment into health insurance scheme. This study uses the SPEC framework which encapsulates several exclusionary factors to explain some of the key determinants of enrolment into health insurance schemes by women.

The SPEC (social, political, economic and cultural) framework

Social exclusion can be described as the systematic denial of particular groups of people from fully enjoying a set of social opportunities, such as the right to “participate on equal terms in social relationships in economic, social, cultural or political arenas” [33]. Social exclusion theory builds on the evidence that the causes of poverty and inequality are embedded in the structures of social systems and relationships – in exclusionary processes – and not in individual inadequacies [34]. This theory was established by the Social Exclusion Knowledge Network (SEKN) whose aim was to present a framework for understanding and tackling social exclusion [35]. The SPEC model is therefore built on the exclusionary theory proposed by SEKN, which defines social exclusion in the following way: exclusion consists of dynamic, multidimensional processes driven by unequal power relationships interacting across four main dimensions – economic, political, social and cultural and at different levels including individual, household, group, community, country and global levels [36]. In Ghana, health inequities are seen to be a major form of social exclusion. There are rural-urban disparities in access to health care services, inequitable distribution of health workers; disparities in access to health services between rich and poor and gender gaps in access due to poverty and deprivation.

Based on the multidimensional nature of social exclusion, a four dimensional framework was developed by the research team (Health Inc) to allow the study to capture all aspects of social exclusion. Through literature review, Health Inc explored each of these four dimensions, resulting in the Health Inc SPEC framework. The domains and variables, and hypothesis on how they are linked to social exclusion and access to social protection programs in Ghana, are described in the Table 1. The social dimension is constituted by proximal relationships of support and solidarity (such as friendship, kinship, family, neighbourhood, community, social movements) that generate a sense of belonging within social systems. Social bonds are strengthened or weakened along this dimension [33]. The political dimension is constituted by power dynamics in relationships which generate unequal patterns of formal rights embedded in legislation, constitutions, policies and practices and the conditions in which rights are exercised, including access to safe water, sanitation, shelter, transport and power and to services such as healthcare, education and social protection. In the context of this study we looked at two main

areas, political resources and political and civic participation. The economic dimension is constituted by access to, and distribution of, material resources necessary to sustain life (such as income, employment, housing, land, working conditions and livelihoods). The final area is the cultural dimension where we consider the patterns of relational exclusion that have been found to have cultural and historical origins, where people uphold norms and values which lead them to set themselves above others based on a variety of attributes. Boundaries between social and cultural dimensions are difficult to draw because social participation is highly connected to cultural aspects such as values and norms translated into current social practices.

**Table 1 SPEC Framework: Dimensions, Domains, Variables and Indicators**

*Methodology*

*Study design*

The study uses data from a cross-sectional household survey conducted in five districts of Ghana in 2012. A multi-staged systematic sampling approach was used to select the households for the study. The first level was the random selection of the 5 districts representative of three ecological zones in Ghana. The five districts comprised Abura-Asebu-Kwamankese (AAK), Kwaebibrim, Ejisu-Juaben Municipal, Asutifi and Savelugu-Nanton. Secondly, in each district, 27 Enumeration Areas (EAs) were randomly selected based on the 2000 Ghana Population and Housing Census for the selected districts [37]. These EAs are made up of rural and urban localities and are determined by the GSS for nationally representative surveys. Finally, 30 households were sampled from the household listing in each EA. Thus, in each district, 810 households (i.e. 30 households x 27 EAs) were interviewed resulting in a total of 4,050 households with an estimated household population of 16,200. In each household, the respondent was the head or an adult member who is normally responsible for major household decisions.

The household questionnaire was made up of two modules with the first part focused on general information about the household and its members. Information collected included socio-economic and demographic characteristics of the household members, their health status, NHIS membership status, reasons for non-membership, access to social services and ownership of assets, among others. The second module assessed the awareness and opinions of the household head or the spouse on specific social, political, economic and cultural factors which are likely to



act as drivers of social exclusion. It also assessed their opinions on the NHIS. While the first module was answered by the household head, the second was answered separately by the household head and the spouse if available. A total of 5,292 social exclusion (i.e. module 2) questionnaires were administered of which 60% (3,173) of the respondents were women.

### *Theoretical framework*

The choice of the estimation model for this study is based on the expected utility theory which has been used to explain decision making under conditions of uncertainty in Welfare economics (27, 38-39). Cutler and Zeckhauser [39] have explained that the value of health insurance is rooted in the unpredictability of medical spending associated with ill-health. People's attitude to this risk is important in the decision to purchase health insurance or not. Though some individuals may be aware of their health state, many may have little or no idea about future cost of illness at the time they decide to purchase health insurance. Health insurance is expected to reduce this uncertainty associated with ill health and the resulting financial consequences [38-39]. The decision by an individual to purchase health insurance or not is treated as a discrete choice problem under the assumption that the individual chooses the alternative which provides the greatest utility [40-41]. Given that the choice available to a particular woman is whether to enroll in the NHIS or not, this was treated as a binary choice problem and estimated by a logistic regression.

### *Statistical analysis*

We assessed the determinants of enrolment in the NHIS for women aged 15 years and above by estimating a binary logistic regression model. The dependent variable is the current health insurance status of a woman which is treated as a binary variable where the probability of enrolment in the NHIS is specified as:

$$Enrolled_i = \beta_0 + \beta_1 X_i + \beta_2 SPEC_i + \epsilon_i$$

*Enrolled<sub>i</sub>* is a binary variable that denotes the enrolment status of a woman; where *Enrolled* =1 if a woman is currently enrolled in the NHIS and *Enrolled* =0 if the woman is not.

*X<sub>i</sub>* is a set of general variables;

SPEC<sub>i</sub> is a set of key variables selected across social, political, economic and cultural (SPEC) dimensions;  
 $\epsilon_i$  is the random error.

The choice of the independent variables is informed by recent studies in assessing the determinants of enrolment in the NHIS in Ghana and other LMICs [8,11, 15, 27 -29, 42]. Table 2 presents a detail description of the variables used for the estimation of the determinants of enrolment of women into the NHIS in Ghana. The independent variables included in the estimation were grouped into personal/demographic characteristics of the women, socio-cultural variables, gender-specific variables, perceptions about quality of health care at health facilities, perceptions about the NHIS, political variables and economic variables. The demographic characteristics included variables such as district of residence and whether the woman resided in a rural and urban locations, their ages, religious affiliation, marital status and whether the woman had a chronic illness as a proxy for their health status. Respondents were also asked to indicate whether they had given birth in the last 12 months prior to the survey.

The sociocultural variables on the other hand consisted of a series of questions to solicit the respondents' views on proximal relationships of support and solidarity in their communities. They were asked about their membership in social associations, their ability to participate in community activities, their satisfaction about their currently social life and whether or not they have ever face any form of discrimination in their community. The gender-specific questions focused on autonomy, empowerment and how they perceived power dynamics in their relationships.

Respondents were asked to express their perception about the quality of healthcare at health facilities. The questions covered issues such as respect to patients, communication, availability of information, patient privacy and whether their health facilities really serve their needs. In addition, respondents answered questions on how they felt about the NHIS with respect to convenience of NHIS, trust, quality of service, their understanding of the solidarity concept inherent in the NHIS and their overall satisfaction about the performance of the NHIS. The political variables included educational attainment of respondents and their spatial access to

important social services such as health and information which tend to result in the unequal distribution of opportunities which create unequal living conditions. The political participation in community and national activities were examined. Finally, the economic variables sought to measure respondents' economic empowerment in the area of work and the ownership of material resources necessary to sustain life.

A number of SPEC variables (as explained under the SPEC domains) were used to construct indices for each of the four SPEC dimensions using principal component analysis (PCA). These were sociocultural, political and economic indices. The economic index score was however divided into quintiles and household wealth status and paid or unpaid income. The household wealth status was generated using PCA based on asset indicators ranging from households' dwelling characteristics to access to utilities and sanitation facilities as well as households' ownership of consumer durables such as refrigerator, bicycle, television, radio and mobile phone [43]. Additional indices generated include gender, quality of care at health facility and perception of the NHIS.

From the variables listed in Table 2, an empirical model was built for the estimation and was specified as follows:

$$\log[p/(1-p)] = F(\beta_0 + \beta_1 \text{District} + \beta_2 \text{Location} + \beta_3 \text{Age} + \beta_4 \text{Religion} + \beta_5 \text{Marital} + \beta_6 \text{Relation} + \beta_7 \text{Chronic} + \beta_8 \text{Childbirth} + \beta_9 \text{Socio-cultural\_index} + \beta_{10} \text{Gender\_index} + \beta_{11} \text{Quality\_index} + \beta_{12} \text{Perception\_index} + \beta_{13} \text{Political\_index} + \beta_{14} \text{Economic\_index})$$

The logit model was deemed appropriate for the estimation because it is commonly used for the estimation of a binary outcome variable (i.e. insurance status) and also generates coefficients which can be transformed into odds ratios for easy interpretation [40, 44]. All statistical analyses were performed using STATA 14.0 software. The model goodness-of-fit was assessed using Hosmer-Lemeshow test and the result that the model fits the data well ( $p=0.4179$ ) [41]. A test for multicollinearity among the exploratory variables was performed using Variance Inflation Factor (VIF) test. The results showed that the VIF test has a mean value of 2.72 (max=4.83), an indication of no multicollinearity problem.

**Results**

*Descriptive statistics*

About 58 percent of the 3,173 women were active members of the scheme having in their possession valid NHIS membership cards as at the time of the survey (Table 3). Only 3.3% of the women were below twenty years while about 7% were 70 years or more. The majority (67.2%) were between 20-49 years. More than half of them had urban residence with a significant proportion (59%) of the insured being urban dwellers ( $p=0.000$ ). About 63 percent of the women were married with no significant difference between insured and uninsured ( $p=0.134$ ). About 40 percent of the women were heads of their households with the majority (50%) being spouses of the household head. On health status, the insured women were more likely to report a chronic health problem (10.8 vs. 4.5,  $p=0.000$ ). A higher proportion of the insured women compared to the uninsured reported to have given birth in the last 12 months prior to the survey (13.9% vs. 8.8%,  $p=0.000$ ).

On the social-cultural dimension, the results did not show any significant difference in the scores between insured and uninsured women. A significant proportion of the insured women had a positive score on the gender index (78.8% vs. 70.4%,  $p=0.000$ ). The gender score reflects a woman's assertiveness; therefore, a higher score means a woman is more assertive in the home. A similar observation was made with respect to the perception about quality of healthcare, the perception about the NHIS and the political variable. For instance, a significant proportion of the insured had a positive score on the perception of the NHIS than the uninsured (63.3% vs. 53.7%,  $p=0.000$ ). On the economic index, the results show a significant difference between the insured and uninsured women with respect to their wealth status ( $p=0.000$ ). There were a higher proportion of the uninsured women in the first (poorest) (28.6% vs 14%) and second poorest (22.35% vs 18.4%) wealth quintiles.

**Table 3: Descriptive statistics of selected variables by health insurance status of women in Ghana, 2012**

*Determinants of enrolment in the NHIS by women*

Table 4 presents the estimates of the determinants of enrolment in the NHIS by women. Results show that the district of residence and whether a woman resides in urban location have positive effect on enrolment in the NHIS. Generally, compared with the Ejisu-Juabeng district in the Ashanti region, being in the Abura-Asebu-Kwamankese district in the Central region and the Savelugu-Nanton district in the Northern region reduces the odds of a woman's enrolment in the NHIS. The two districts are relatively poor and dominantly rural.

With regards to age, elderly women aged 70 years or more were 3.5 three times more likely to enrol in the NHIS relative to women aged 15-19 years. The likelihood of enrolment into the NHIS was also observed to decrease with other women in the households relative to the woman who is the head. Women with chronic health problems were about 2.2 times more likely to be members of the NHIS relative to those without chronic illness. The odds of enrolment in the NHIS also increases with women who reported to have given birth in the past 12 months.

Generally, women with gender assertiveness and score positive on the gender index were 1.4 times more likely to enroll in the NHIS compared to those who score negative. The results also show that having positive perceptions about the quality of health care at health facilities and about the performance of the NHIS increases the likelihood of women enrolling into the scheme. Finally, from an economic perspective, household's wealth status has a positive and significant effect on a woman's insurance status. The probability of enrolling in the NHIS increases with an increase in household's wealth status. Women in the third wealth quintile are 1.9 times more likely to enrol in the NHIS compared to women in the first wealth quintile. This increases to 2.5 times and 4.2 times for women in the fourth and fifth wealth quintiles respectively.

The sociocultural index is a significant determinant of enrolment in the NHIS (1 percent significance level). For the exposure status to be related to the outcome, the relative risk must differ from 1. However, the relative risk is 1.00 for a negative score and 0.85 for a positive score, which implies that there is only a small difference in the way a unit increment in the sociocultural index affects the two groups (insured and uninsured). The same is reflected in the political index score.

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**Table 4: Logistic regression estimates of the determinants of enrolment in the NHIS by women in Ghana, 2012**

**Discussion**

This study sought to assess the determinants of women’s enrolment in the NHIS in order to identify the groups of women who are not participating in the NHIS and whether this could be attributed to social exclusion. Our study shows that enrolment is relatively higher among the elderly women which points to the fact that they may be taking advantage of the exemptions offered to elderly aged 70 years and above under the NHIS. On the flip side, elderly women residing in rural areas, widowed, uneducated and from poor households raises are vulnerable. Parmar et al. [15] found a strong evidence of inequity in enrolment caused by a combination of economic, political and socio-cultural factors with elders in the richest quartiles being more likely to enrol than those in the poorest quartile.

Rural-urban disparities have been well profiled and documented in several studies in Ghana. Residents of urban slums, extremely poor people in the northern regions of Ghana and people who are geographically isolated due to lack of road access face extreme challenges in accessing social services [45]. In line with this profiling, our results show that rural women were less likely to enroll in the NHIS with reasons being that NHIS registration centres were far from their communities they had limited information about the scheme. Long distances to registration centres, registration process rigidities and activities of unscrupulous NHIS registration agents have been noted to exclude rural women from enrolling in the NHIS [14, 36,46]. Longer distances to health facilities means that sometimes the cost of transportation to seek health care could exceed the cost of enrolling in the NHIS. This could discourage people from enrolling in the scheme.

The importance of the health status as a determinant of enrolment into the health insurance is clear from the results. Kirigia et al [27] show that having excellent or good health had a negative effect on the log of odds of health insurance ownership among women in South Africa. Individuals who are less healthy or suffering from chronic diseases may join the health insurance

scheme in order to enjoy its benefits [47]. The results also show that women who have given birth in the past 12 months are more likely to be insured. This could be due to the free maternal policy under the NHIS.

The role of economic factors emerges in our study as important determinants of enrolment in the NHIS. From the descriptive statistics, the insured and uninsured differed significantly in their wealth status. Generally, women in Ghana dominate the informal economy often running small businesses which require low capital injections but yield very low incomes. As observed by Alfes [12] there are a significant number of informal workers who do not earn enough to be able to afford to pay the NHIS premium. As observed by other studies, our results show a positive relationship between wealth status and enrolment in the NHIS, buttressing the point that a woman from a poorly resourced household would more likely be excluded from enrolling in the NHIS. In a study among women aged 15-49 years in the Upper East region of Ghana, it was observed that enrolment into the NHIS is influenced by household's socio-economic status and location of residence among others [48]. Perception of the quality of care at health facilities and perception of the NHIS are significant factors to enrolment. Some insured patients, do complain of poor quality of health services provided at the health facilities which include long waiting times, bad attitude by health facility staff, and drug shortages [31, 49, 50].

The study provides a quantitative assessment of the multiple factors that affect enrollment into social protection programs and also highlights the importance of economic factors as the key drivers of social exclusion in this process. However, social exclusion is a complex and dynamic concept which will require further research to unpack the exclusionary mechanisms. In addition, the survey in Ghana was part of a larger study exploring enrolment of all individuals in NHIS and was not specifically targeted towards the female population.

## **Conclusion**

By conceptualising social exclusion as the multi-dimensional processes driven by unequal power relationships which lead to differential inclusion and exclusion in social systems, our study provides evidence of factors that influence women enrolment into the NHIS. With women dominating the informal sector of Ghana's economy, the NHIS is seen as an important social protection intervention for informal workers and especially women. While not all the uninsured



women could be described as socially excluded from the NHIS, the results suggest that factors that drive women to be socially excluded from enrolling in the NHIS are economically related. Others include age, health status, locality, perception about the quality of care at health facilities and the perception of the NHIS. How the NHIS adapts its features to ensure access for these vulnerable groups for whom these factors become a clear barrier to accessing health services needs critical attention. Policy should aim at identifying and targeting these excluded women. Rural–urban disparities with regards to general infrastructure need to be addressed to reduce the physical barriers to health care and to encourage more people to enrol in the scheme.

**List of abbreviations**

CHPS	Community Health Posts Services
EAs	Enumeration Areas
IRB	Institutional Review Board
NGOs	Non-Governmental Organisations
NHIS	National Health Insurance Scheme



NMIMR	Noguchi Memorial Institute for Medical Research
SEKN	Social Exclusion Knowledge Network
SPEC	Social, Political, Economic and Cultural

### **Ethics approval and consent to participate**

Ethical clearance was sought and granted from the Institutional Review Board (IRB), of the Noguchi Memorial Institute for Medical Research (NMIMR), University of Ghana before the study was done. Study objectives, benefits, risks and the right to refuse participation and confidentiality of responses were explained to participants. Written informed consent was obtained from each participant.

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**Table 1. SPEC FRAMEWORK: DIMENSIONS, DOMAINS, VARIABLES AND INDICATORS**

Domains	Hypothesis	Indicator(s) selected
SOCIOCUTURAL DIMENSION		

<b>Social discrimination</b>	Social discrimination can generate power dynamics that underpins resource distribution patterns. They can affect access to economic resources and economic, political and civic participation of an individual.	Urban / Rural split
<b>Social capital/ Social and community participation</b>	<p>Social participation is highly connected to economic resources and social support. Feeling of solidarity directly impacts on the volumes of social protection transfers, and so to say on economic resources. Boundaries between social and cultural dimensions are difficult to draw because social participation is highly connected to cultural aspects such as values and norms, translated into current social practices.</p> <p>Limited social and community participation may reflect the low status of the individual in the community and the individual may feel 'excluded'.</p>	<p>Participation in common social activities</p> <p>Member of any social/cultural association or club</p>
<b>POLITICAL DIMENSION</b>		
<b>Access to information and services</b>	<p><b><u>Access to health</u></b></p> <p>The link between health and economic resources is widely demonstrated, in both directions: good health reduces economic vulnerability, while better economic situation is related to better health. Access to health care thus impacts on economic resources, as well as on opportunities of economic participation. More recent research has demonstrated correlation between distance to health facilities and enrolment in health insurance schemes</p>	Distance to public health centre
	<p><b><u>Access to transport infrastructures</u></b></p> <p>Access to good roads has implications on access to health facilities and economic participation. Where this is lacking, populations feel more excluded from basic infrastructure and services.</p>	Distance to the nearest all-seasoned road
	<p><b><u>Access to administrative services</u></b></p> <p>Access to district capital is correlated to economic participation and also access to institutions who are based in district capitals. For instance, the NHIS district offices are more accessible to those who live closer to the district capital.</p>	Distance to the district capital
	<p><b><u>Access to information</u></b></p> <p>Access to information and communication technologies is increasingly correlated to economic participation, social resources, as well as education opportunities.</p> <p>Lack of information about health care facilities as well information about schemes, policies and programs can be a key determinant for individuals to be left out from these interventions.</p>	Ownership of a radio or television



<b>Political participation</b>	<b><u>Civic participation</u></b>  Economic participation, as well as social participation both triggers sense of belongingness and hope for the future, factors that increase civic and political participation. This implies having a sense of empowerment which is reflected in one's participation in decisions in the household	Free to express personal opinion in the family  Free to express personal opinion in group meeting
	<b><u>Democratic participation</u></b>  Civic participation results in the development of social networks.  Civic participation is related to access to political resources.  Affiliation/disaffiliation from the political system are related to economic resources.	Voted in any recent elections
<b>ECONOMIC DIMENSION</b>		
<b>Material and economic resources</b>	<b><u>Physical and financial assets</u></b> Poverty is a major risk factor in all other domains of social exclusion. Poverty is associated with hunger, low health and education status and lower productivity. It can limit people's savings, property ownership and access to credit and reduce hopes, aspirations, and self-esteem leaving them less able to improve their situation.	Ownership of property/assets (radio, TV, telephone, bike, or motorbike etc).

**Table 2: Definition of variables**

Variable	Variable description
<b>Dependent variable</b>	
<i>Insurance status</i>	0 = Uninsured, 1 = Insured
<b>Independent variables</b>	
<b>Personal/Demographic characteristics</b>	
<i>District</i>	District of residence. 0=Ejisu-Juabeng, 1=Asutifi, 2=AAK, 3=Kwaebibrem, 4=Savelugu
<i>Location</i>	Location of residence. 0=Rural, 1=Urban
<i>Age</i>	Respondent's age in years. Age categories (0=15-19years, 1=20-29years, 2=30-39years, 3=40-49years, 4=50-59years, 5=60-69years, 6= $\geq$ 70 years)
<i>Religion</i>	Religious affiliation of respondent. 0 = Christian, 1 = Muslim, 2 = other



<i>Marital</i>	Marital status of respondent. 0 = never married, 1 = married/in union, 2 = divorced/separated, 3 = widowed
<i>Relations</i>	Respondent's relationship to household head. 0 = household head, 1 = spouse, 2 = child, 3 = other
<i>Chronic/Health</i>	Presence of a chronic illness. 0 = No, 1 = Yes
<i>Childbirth</i>	Given birth in the past 12 months. 0=No, 1=Yes
<b><i>Socio-cultural variables for the construction of the Socio-cultural index</i></b>	
<i>Membership association</i>	Respondent is a member of a social organisation. 0 = No, 1 = Yes
<i>Participation</i>	Respondent is able to participate in social activities in community. 0 = No, 1 = Yes
<i>Social_life</i>	Satisfied with social life lately. 0=Disagree, 1=Agree
<i>Personal_fate</i>	A person's fate is determined by God. 0=Disagree, 1=Agree
<i>Discrimination</i>	I have ever faced discrimination in my community. 0=Yes, 1=No
<b><i>Gender related variables for the construction of an index for Gender</i></b>	
<i>Gender1</i>	A good wife obeys her husband even if she disagrees with him. 0=Disagree, 1=Agree
<i>Gender2</i>	A man has a good reason to hit his wife if she doesn't complete housework to his satisfaction. 0=Agree, 1=Disagree
<i>Gender3</i>	A man has a good reason to hit his wife if she refuses to have sexual relations with him. 0=Agree, 1=Disagree
<i>Gender4</i>	A man has a good reason to hit his wife if she disobeys him. 0=Agree, 1=Disagree
<i>Gender5</i>	I make my own decision to seek health care when I am sick. 0=No, 1=Yes
<b><i>Perceptions about quality of health care at health facility for the quality index</i></b>	
<i>Respect</i>	I feel I am treated with respect when I visit the health facility. 0=No, 1=Yes
<i>Concerns</i>	I feel my concerns are listened to seriously by medical staff. 0=No, 1=Yes
<i>Needs</i>	I feel I receive services that covers my needs at the health facility. 0=No, 1=Yes
<i>Information</i>	I get sufficient information from medical staff when I visit the health facility. 0=No, 1=Yes
<i>Privacy</i>	I feel health facilities provide adequate privacy during examination.
<i>Communication</i>	I do understand the vocabulary used by medical staff during consultation. 0=No, 1=Yes
<b><i>Perception about the NHIS for the construction of perception index</i></b>	
<i>Perception1</i>	Spending money on health insurance is not a priority. 0=Disagree, 1=Agree
<i>Perception2</i>	Health insurance is something for the poor. 0=Agree, 1=Disagree
<i>Perception3</i>	It is good to be a member of the NHIS even if you don't fall sick. 0=Disagree, 1=Agree
<i>Perception4</i>	The NHIS office for registration and renewal is convenient. 0=No, 1=Yes
<i>Perception5</i>	Insured members of the NHIS are given poor quality medicines. 0=Yes, 1=No
<i>Perception6</i>	NHIS members still pay for drugs and treatment. 0=Yes, 1=No
<i>Perception7</i>	I do trust the NHIS. 0=No, 1=Yes
<i>Perception8</i>	I am satisfied with the performance of the NHIS. 0=No, 1=Yes
<b><i>Political variables for the construction of the Political index</i></b>	
<i>Education</i>	Years of schooling. 0=No formal education, 1=<6 years, 2=6-10 years, 3=Secondary/Higher
<i>Health_15mins</i>	Reside within 15 minutes distance to the nearest public health centre. 0 = No, 1 = Yes
<i>Road_15mins</i>	Reside within 15 minutes distance to the nearest all-seasoned road. 0 = No, 1 = Yes
<i>Capital_60mins</i>	Reside within 60 minutes distance to the district capital. 0 = No, 1 = Yes
<i>Radio_TV</i>	Whether household has access to radio or television. 0 = No, 1 = Yes
<i>Vote</i>	Respondent voted in the recent national elections. 0 = No, 1 = Yes
<i>Opinions_family</i>	Free to express personal opinions in the family. 0 = No, 1 = Yes
<i>Opinions_group</i>	Free to express personal opinions in group meetings. 0 = No, 1 = Yes
<b><i>Economic variables for the construction of the Economic index</i></b>	
<i>Work_12months</i>	Respondent worked for income or family gain in the last 12 months. 0 = No, 1 = Yes
<i>Wealth</i>	Wealth quintiles. 0 = first, 1 = second, 2 = third, 3 = fourth, 4 = fifth

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**Table 3: Descriptive statistics of selected variables by health insurance status of women in Ghana, 2012**

Variables	Health Insurance Status		Total n (%)	<i>p-value<sup>a</sup></i>
	Uninsured n (%)	Insured n (%)		
Personal/Demographic characteristics				
District				
Ejusu-Juabeng	233 (17.8)	449 (24.1)	682 (21.5)	
Asutifi	184 (14.1)	452 (24.2)	636 (20.0)	

Abura-Asebu-Kwamamkese	408 (31.2)	255 (13.7)	663 (20.9)	<b>0.000</b>
Kwaebibrem	195 (14.2)	414 (22.5)	614 (19.4)	
Savelugu-Nanton	287 (21.9)	291 (15.6)	578 (18.2)	
<b>Location of residence</b>				
Rural	709 (54.3)	771 (41.3)	1,480 (46.6)	
Urban	598 (45.8)	1,095 (58.7)	1,693 (53.4)	<b>0.000</b>
<b>Age (years)</b>				
15-19	50 (3.8)	54 (2.9)	104 (3.3)	
20-29	304 (23.3)	507 (27.2)	811 (25.6)	
30-39	307 (23.5)	413 (22.1)	720 (22.7)	<b>0.000</b>
40-49	288 (22.0)	313 (16.8)	601 (18.9)	
50-59	192 (14.7)	254 (13.6)	446 (14.1)	
60-69	113 (8.7)	152 (8.2)	265 (8.4)	
≥70	53 (4.1)	173 (9.3)	226 (7.1)	
<b>Religion</b>				
Christian	943 (72.2)	1,419 (76.1)	2,362 (74.5)	
Muslim	332 (25.4)	422 (22.6)	754 (23.8)	<b>0.000</b>
Other	31 (2.4)	25 (1.3)	56 (1.8)	
<b>Marital status</b>				
Never married	143 (11.0)	204 (11.0)	347 (11.0)	
Married/In-union	841 (64.2)	1,177 (63.0)	2,018 (63.5)	0.134
Divorced/separated	165 (12.7)	209 (11.2)	374 (11.8)	
Widowed	158 (12.1)	276 (14.8)	434 (13.7)	
<b>Relationship to household head</b>				
Head	503 (38.5)	773 (41.4)	1,276 (40.2)	
Spouse	667 (51.0)	913 (48.9)	1,580 (49.8)	0.407
Child	100 (7.7)	132 (7.1)	232 (7.3)	
Other	37 (2.8)	48 (2.6)	85 (2.7)	
<b>Health status</b>				
Presence of chronic illness (% Yes)	59 (4.5)	202 (10.8)	261 (8.2)	<b>0.000</b>
Childbirth in the last 12 months (% Yes)	115 (8.8)	259 (13.9)	374 (11.8)	<b>0.000</b>

**Table 3: Descriptive statistics of selected variables by health insurance status of women in Ghana, 2012 (Continued)**

China, 2012 (Continued)				
Variables	Health Insurance Status		Total n (%)	p-value
	Uninsured n (%)	Insured n (%)		
Sociocultural index score				
Negative	811 (62.1)	1,148 (61.5)	1,959 (61.7)	

Positive	496 (37.9)	718 (38.5)	1,214 (38.3)	0.763
Gender index score				
Negative	387 (29.6)	395 (21.2)	782 (24.7)	
Positive	920 (70.4)	1,471 (78.8)	2,391 (75.3)	0.000
Perception about quality of healthcare index score				
Negative	525 (40.2)	467 (25.0)	992 (31.3)	
Positive	782 (59.8)	1,399 (75.0)	2,181 (68.7)	0.000
Perception about NHIS index score				
Negative	482 (36.9)	375 (20.1)	857 (27.0)	
Positive	825 (63.1)	1,491 (79.9)	2,316 (73.0)	0.000
Political index score				
Negative	605 (46.3)	684 (36.7)	1,289 (40.6)	
Positive	702 (53.7)	1,182 (63.3)	1,884 (59.4)	0.000
Economic index score (Wealth quintiles)				
First (poorest)	374 (28.6)	262 (14.0)	636 (20.0)	
Second	291 (22.3)	344 (18.4)	635 (20.0)	
Third	262 (20.2)	371 (19.9)	633 (20.0)	0.000
Fourth	225 (17.2)	410 (22.0)	635 (20.0)	
Fifth (richest)	155 (11.9)	479 (25.7)	634 (20.0)	
Total	1,307	1,866	3,173	

a. Pearson's chi-square ( $\chi^2$ ) test for categorical variables

Table 4: Logistic regression estimates of the determinants of enrolment in the NHIS by women in Ghana, 2012

Variables	Odds Ratio <sup>a</sup>	[95% Confidence Interval]		VIF <sup>b</sup>	Coef.	“t”
		Lower	Upper			
Personal/Demographic characteristics						
District						
Ejisu-Juabeng	1.00					
Asutifi	1.67***	1.29	2.16	1.96	0.51	0.00
AAK	0.38***	0.30	0.48	2.01	-0.97	0.00
Kwaebibirem	1.33*	1.03	1.72	1.91	0.29	0.03
Savelugu-Nanton	0.67*	0.44	1.00	4.62	-0.41	0.05
Location of residence						
Rural	1.00					
Urban	1.30***	1.10	1.55	2.55	0.27	0.00
Age (years)						
15-19	1.00					

20-29	1.35	0.84	2.15	4.83	0.30	0.21
30-39	1.07	0.65	1.77	4.66	0.07	0.78
40-49	0.99	0.59	1.67	4.23	-0.01	0.98
50-59	1.19	0.69	2.03	3.64	0.17	0.54
60-69	1.21	0.68	2.17	2.77	0.19	0.52
70+	3.49***	1.85	6.58	2.86	1.25	0.00
<b>Religion</b>						
Christian	1.00					
Muslim	1.29	0.93	1.78	3.8	0.25	0.13
Other	0.86	0.46	1.60	1.06	-0.15	0.63
<b>Marital status</b>						
Married	1.00					
Never married	1.02	0.72	1.45	1.96	0.02	0.89
Divorced/Separated	0.83	0.61	1.15	1.84	-0.18	0.27
Widowed	0.98	0.70	1.38	2.45	-0.02	0.91
<b>Relations to household head</b>						
Head	1.00					
Spouse	0.77*	0.60	0.99	4.6	-0.27	0.04
Child	0.78	0.53	1.13	1.63	-0.25	0.19
Other	0.59**	0.36	0.99	1.13	-0.52	0.05
<b>Health status</b>						
No chronic illness	1.00					
Chronic illness	2.17***	1.53	3.06	1.26	0.77	0.00
<b>Childbirth in the past 12 months</b>						
No	1.00					
Yes	1.73***	1.32	2.26	1.3	0.55	0.00

**Table 4: Logistic regression estimates of the determinants of enrolment in the NHIS by women in Ghana, 2012 (continued)**

Variables	Odds Ratio <sup>a</sup>	[95% Conf. Interval]		VIF <sup>b</sup>	Coef.	“t”
		Lower	Upper			
Sociocultural index score						
Negative	1.00					
Positive	0.85**	0.72	1.01	1.66	-0.16	0.06
Gender index score						
Negative	1.00					
Positive	1.35***	1.12	1.62	4.28	0.30	0.00
Perception about health care index score						
Negative	1.00					
Positive	1.78***	1.50	2.12	3.27	0.58	0.00
Perception about NHIS index score						
Negative	1.00					

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Positive	2.25***	1.89	2.69	3.74	0.81	0.00
Political index score						
Negative	1.00					
Positive	1.10	0.92	1.30	2.88	0.09	0.30
Economic index score (wealth quintiles)						
First (poorest)	1.00					
Second	1.53***	1.19	1.97	2.05	0.43	0.00
Third	1.85***	1.44	2.39	2.1	0.62	0.00
Fourth	2.47***	1.91	3.21	2.19	0.91	0.00
Fifth (richest)	4.16***	3.12	5.56	2.5	1.43	0.00
Constant	0.18	0.10	0.34		-1.69	0.00
Total observation (N)		3,172				
LR $\chi^2$ (30)		653.30***				
Pseudo $R^2$ (Cox-Snell)		0.186				
Pseudo $R^2$ (Nagelkerke)		0.251				
Hosmer-Lemeshow statistic ( $P>\chi^2$ )		11.67(0.17)				
Mean VIF (max)		2.72 (4.83)				
Note:						
a. *p<0.05, **p<0.01, ***p<0.001						
b. uncentered variance inflation factors						